**LISTING OF THE CLAIMS**

1-65 (Cancelled)

66. (Withdrawn) A semiconductor-on-insulator structure comprising first and second layers which are attached to one another either directly or through one or more intermediate layers, wherein:

(a) the first layer comprises a substantially single-crystal semiconductor material;

(b) the second layer comprises an oxide glass or an oxide glass-ceramic; and

(c) the bond strength between the first and second layers is at least 8 joules/meter$^2$.

67. (Withdrawn) The semiconductor-on-insulator structure of Claim 66 wherein the bond strength between the first and second layers is at least 10 joules/meter$^2$.

68. (Withdrawn) The semiconductor-on-insulator structure of Claim 66 wherein the bond strength between the first and second layers is at least 15 joules/meter$^2$.

69. (Withdrawn) A semiconductor-on-insulator structure comprising first and second layers which are attached to one another either directly or through one or more intermediate layers, wherein:

(a) the first layer:

(i) comprises a substantially single-crystal semiconductor material;

(ii) has first and second substantially parallel faces separated by a distance $D_S$, the first face being closer to the second layer than the second face;

(iii) has a reference surface which 1) is within the first layer, 2) is substantially parallel to the first face, and 3) is separated from that face by a distance $D_S/2$; and

(iv) has a region of enhanced oxygen concentration which begins at the first face and extends towards the second face, said region having a thickness $\delta_H$ which satisfies the relationship:

$\delta_H \leq 200$ nanometers,

where $\delta_H$ is the distance between the first face and a surface which 1) is within the first layer, 2) is substantially parallel to the first face, and 3) is the surface farthest from the first face for which the following relationship is satisfied:

$$C_O(x) - C_{O/Ref} \geq 50 \text{ percent}, \quad 0 \leq x \leq \delta_H,$$

where:

$C_O(x)$ is the concentration of oxygen as a function of distance x from the first face,

$C_{O/Ref}$ is the concentration of oxygen at the reference surface, and

$C_O(x)$ and $C_{O/Ref}$ are in atomic percent; and

(b) the second layer comprises an oxide glass or an oxide glass-ceramic.

70. (Withdrawn) A semiconductor-on-insulator structure comprising first and second layers which are attached to one another either directly or through one or more intermediate layers, wherein:

(a) the first layer comprises a substantially single-crystal semiconductor material, said layer having a surface farthest from the second layer which is an exfoliation surface; and

(b) the second layer:

(i) has first and second substantially parallel faces separated by a distance $D_2$, the first face being closer to the first layer than the second face;

(ii) has a reference surface which 1) is within the second layer, 2) is substantially parallel to the first face, and 3) is separated from that face by a distance $D_2/2$;

(iii) comprises an oxide glass or an oxide glass-ceramic which comprises positive ions of one or more types, each type of positive ion having a reference concentration $C_{i/Ref}$ at the reference surface; and

(iv) has a region which begins at the first face and extends towards the reference surface in which the concentration of at least one type of positive ion is depleted relative to the reference concentration $C_{i/Ref}$ for that ion (the positive ion depletion region).

71. (Withdrawn) A semiconductor-on-insulator structure comprising first and second layers which are attached to one another either directly or through one or more intermediate layers, wherein:

(a) the first layer comprises a substantially single-crystal semiconductor material, said layer having a thickness of less than 10 microns; and

(b) the second layer:

(i) has first and second substantially parallel faces separated by a distance $D_2$, the first face being closer to the first layer than the second face;

(ii) has a reference surface which 1) is within the second layer, 2) is substantially parallel to the first face, and 3) is separated from that face by a distance $D_2/2$;

(iii) comprises an oxide glass or an oxide glass-ceramic which comprises positive ions of one or more types, each type of positive ion having a reference concentration $C_{i/Ref}$ at the reference surface; and

(iv) has a region which begins at the first face and extends towards the reference surface in which the concentration of at least one type of positive ion is depleted relative to the reference concentration $C_{i/Ref}$ for that ion (the positive ion depletion region).

72. (Withdrawn) A semiconductor-on-insulator structure comprising first and second layers which are attached to one another either directly or through one or more intermediate layers, wherein:

(a) the first layer (i) comprises a substantially single-crystal semiconductor material and (ii) has a maximum dimension greater than 10 centimeters; and

(b) the second layer comprises an oxide glass or an oxide glass-ceramic which comprises positive ions of one or more types, wherein the sum of the concentrations of lithium, sodium, and potassium ions in the oxide glass or oxide glass-ceramic on an oxide basis is less than 1.0 weight percent.

73. (Withdrawn) The semiconductor-on-insulator structure of Claim 72 wherein the sum of the concentrations of lithium, sodium, and potassium ions in the oxide glass or oxide glass-ceramic on an oxide basis is less than 0.1 weight percent.

74. (Withdrawn) A semiconductor-on-insulator structure comprising first and second layers which are attached to one another either directly or through one or more intermediate layers, wherein:

(a) the first layer comprises a substantially single-crystal semiconductor material; and

(b) the second layer:

(i) has first and second substantially parallel faces separated by a distance $D_2$, the first face being closer to the first layer than the second face;

(ii) has a reference surface which 1) is within the second layer, 2) is substantially parallel to the first face, and 3) is separated from that face by a distance $D_2/2$;

(iii) comprises an oxide glass or an oxide glass-ceramic which comprises positive ions of one or more types, each type of positive ion having a reference concentration $C_{i/Ref}$ at the reference surface;

(iv) has a region which begins at the first face and extends towards the reference surface in which the concentration of at least one type of positive ion is depleted relative to the reference concentration $C_{i/Ref}$ for that ion (the positive ion depletion region), said region having a distal edge; and

(v) has a region in the vicinity of said distal edge in which the concentration of at least one type of positive ion is enhanced relative to $C_{i/Ref}$ for that ion (the pile-up region).

75. (Withdrawn) The semiconductor-on-insulator structure of Claim 74 wherein the at least one type of positive ion has a peak concentration $C_{i/Peak}$ in the pile-up region which satisfies the relationship:

$$C_{i/Peak}/C_{i/Ref} \geq 1,$$

where $C_{i/Peak}$ and $C_{i/Ref}$ are in atomic percent.

76. (Withdrawn) A semiconductor-on-insulator structure comprising first and second layers which are attached to one another either directly or through one or more intermediate layers with a bond strength of at least 8 joules/meter$^2$, said first layer comprising a substantially single-crystal semiconductor material and said second layer comprising an oxide glass or an oxide glass-ceramic wherein at least a portion of the first layer proximal to the second layer comprises recesses which divide said portion into substantially isolated regions which can expand and contract relatively independently of one another.

77. (Withdrawn) The semiconductor-on-insulator structure of Claim 76 wherein the recesses extend through the entire thickness of the first layer.

78. (Withdrawn) The semiconductor-on-insulator structure of Claim 76 or 77 wherein the bond strength between the first and second layers is at least 10 joules/meter$^2$.

79. (Withdrawn) The semiconductor-on-insulator structure of Claim 76 or 77 wherein the bond strength between the first and second layers is at least 15 joules/meter$^2$.

80. (Withdrawn) The semiconductor-on-insulator structure of Claim 76 or 77 wherein the oxide glass or oxide glass-ceramic has a 0-300°C coefficient of thermal expansion which is greater than the 0°C coefficient of thermal expansion of the substantially single-crystal semiconductor material.

81. (Withdrawn) The semiconductor-on-insulator structure of Claim 66, 69, 70, 71, 72, 74, or 76 wherein the oxide glass or the oxide glass-ceramic of the second layer:

(a) has a 0-300°C coefficient of thermal expansion CTE and a 250°C resistivity $\rho$ which satisfy the relationships:

$5\text{x}10^{-7}/°\text{C} \leq \text{CTE} \leq 75\text{x}10^{-7}/°\text{C}$, and

$\rho \leq 10^{16}\ \Omega\text{-cm}$;

(b) has a strain point $T_s$ of less than 1,000°C; and

(c) comprises positive ions whose distribution within the oxide glass or oxide glass-ceramic can be altered by an electric field when the temperature T of the oxide glass or oxide glass-ceramic satisfies the relationship:

$T_s - 350 \leq T \leq T_s + 350$,

where $T_s$ and T are in degrees centigrade.

82. (Withdrawn) The semiconductor-on-insulator structure of Claim 69, 70, 71, 72, or 74 wherein the bond strength between the first and second layers is at least 8 joules/meter$^2$.

83. (Withdrawn) The semiconductor-on-insulator structure of Claim 70, 71, 72, 74, or 76 wherein the first layer:

(i) has first and second substantially parallel faces separated by a distance $D_S$, the first face of the first layer being closer to the second layer than the second face of the first layer;

(ii) has a first layer reference surface which 1) is within the first layer, 2) is substantially parallel to the first face of the first layer, and 3) is separated from that face by a distance $D_S/2$; and

(iii) has a region of enhanced oxygen concentration which begins at the first face of the first layer and extends towards the second face of the first layer, said region having a thickness $\delta_H$ which satisfies the relationship:

$$\delta_H \leq 200 \text{ nanometers},$$

where $\delta_H$ is the distance between the first face of the first layer and a surface which 1) is within the first layer, 2) is substantially parallel to the first face of the first layer, and 3) is the surface farthest from the first face of the first layer for which the following relationship is satisfied:

$$C_O(x) - C_{O/Ref} \geq 50 \text{ percent}, \quad 0 \leq x \leq \delta_H,$$

where:

$C_O(x)$ is the concentration of oxygen as a function of distance x from the first face of the first layer,

$C_{O/Ref}$ is the concentration of oxygen at the first layer reference surface, and

$C_O(x)$ and $C_{O/Ref}$ are in atomic percent.

84. (Withdrawn) The semiconductor-on-insulator structure of Claim 71, 72, 74, or 76 wherein the first layer has a surface farthest from the second layer which is an exfoliation surface.

85. (Withdrawn) The semiconductor-on-insulator structure of Claim 72, 74, or 76 wherein the first layer has a thickness of less than 10 microns.

86. (Withdrawn) The semiconductor-on-insulator structure of Claim 74 or 76 wherein:

(a) the first layer has a maximum dimension greater than 10 centimeters; and

(b) the second layer comprises an oxide glass or an oxide glass-ceramic which comprises positive ions of one or more types, wherein the sum of the concentrations of lithium, sodium, and potassium ions in the oxide glass or oxide glass-ceramic on an oxide basis is less than 1.0 weight percent.

87. (Withdrawn) The semiconductor-on-insulator structure of Claim 86 wherein the sum of the concentrations of lithium, sodium, and potassium ions in the oxide glass or oxide glass-ceramic on an oxide basis is less than 0.1 weight percent.

88. (Withdrawn) The semiconductor-on-insulator structure of Claim 76 wherein the second layer:

(i) has first and second substantially parallel faces separated by a distance $D_2$, the first face being closer to the first layer than the second face;

(ii) has a reference surface which 1) is within the second layer, 2) is substantially parallel to the first face, and 3) is separated from that face by a distance $D_2/2$;

(iii) comprises an oxide glass or an oxide glass-ceramic which comprises positive ions of one or more types, each type of positive ion having a reference concentration $C_{i/Ref}$ at the reference surface;

(iv) has a region which begins at the first face and extends towards the reference surface in which the concentration of at least one type of positive ion is depleted relative to the reference concentration $C_{i/Ref}$ for that ion (the positive ion depletion region), said region having a distal edge; and

(v) has a region in the vicinity of said distal edge in which the concentration of at least one type of positive ion is enhanced relative to $C_{i/Ref}$ for that ion (the pile-up region).

89. (Withdrawn) The semiconductor-on-insulator structure of Claim 70, 71, or 74 wherein:

(i) the glass or glass-ceramic comprises one or more of the following positive ions: $Li^{+1}$, $Na^{+1}$, $K^{+1}$, $Cs^{+1}$, $Mg^{+2}$, $Ca^{+2}$, $Sr^{+2}$, and/or $Ba^{+2}$ (the alkali/alkaline-earth ions); and

(ii) the positive ion depletion region is depleted of at least one of said alkali/alkaline-earth ions.

90. (Withdrawn) The semiconductor-on-insulator structure of Claim 89 wherein the positive ion depletion region has a thickness $\delta_D$ which satisfies the relationship:

$$\delta_D \geq 10 \text{ nanometers},$$

where $\delta_D$ is the distance between the first face of the second layer and a surface which 1) is within the second layer, 2) is substantially parallel to the first face of the second layer, and 3) is the surface farthest from the first face of the second layer for which the following relationship is satisfied for at least one of the alkali/alkaline-earth ions which the glass or glass-ceramic contains:

$$C_i(x)/C_{i/Ref} \leq 0.5, \quad 0 \leq x \leq \delta_D,$$

where:

$C_i(x)$ is the concentration of said at least one alkali/alkaline-earth ion as a function of distance x from the first face of the second layer, and

$C_i(x)$ and $C_{i/Ref}$ are in atomic percent.

91. (Withdrawn) The semiconductor-on-insulator structure of Claim 90 wherein:

$$\delta_D \geq 1000 \text{ nanometers}.$$

92. (Withdrawn) The semiconductor-on-insulator structure of Claim 66, 69, 70, 71, 72, 74, or 76 wherein the first layer has a thickness $D_S$ which satisfies the relationship:

$$10 \text{ nanometers} \leq D_S \leq 500 \text{ nanometers}.$$

93. (Withdrawn) The semiconductor-on-insulator structure of Claim 66, 69, 70, 71, 72, 74, or 76 wherein the first and second layers are directly attached to one another.

94. (Withdrawn) The semiconductor-on-insulator structure of Claim 66, 69, 70, 71, 72, 74, or 76 wherein the second layer is transparent.

95. (Withdrawn) The semiconductor-on-insulator structure of Claim 66, 69, 70, 71, 72, 74, or 76 wherein the second layer has a thickness $D_2$ which is greater than or equal to 1 micron.

96. (Withdrawn) The semiconductor-on-insulator structure of Claim 66, 69, 70, 71, 72, 74, or 76 further comprising an amorphous or polycrystalline semiconductor material attached to the second layer.

97. (Currently Amended) A semiconductor-on-insulator layered structure comprising a substantially single-crystal semiconductor material (material S) and an oxide glass or an oxide glass-ceramic which comprises positive ions (material G), wherein at least a part of the structure comprises in order:

material S;

material S with an enhanced oxygen content;

material G with a reduced positive ion concentration ~~for at least one type of~~ having substantially no modifier positive ions;

material G with an enhanced positive ion concentration ~~for at least one type of~~ of modifier positive ions, including at least one alkaline earth modifier ion from the material G with a reduced positive ion concentration; and

material G~~,~~

~~wherein the surface of material S farthest from material G is an exfoliation surface, and~~

~~the oxide glass or oxide glass-ceramic has a 0-300°C coefficient of thermal expansion CTE and a 250°C resistivity ρ which satisfy the relationships:~~

~~$5x10^{-7}/°C \leq CTE \leq 75x10^{-7}/°C$, and~~

~~$\rho \leq 10^{16}$ Ω cm,~~

~~said oxide glass or oxide glass-ceramic having a strain point of less than 1,000°C~~.

98. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the at least one type of positive ion comprises an alkali ion.

99. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the at least one type of positive ion comprises an alkaline-earth ion.

100. (Currently Amended) The semiconductor-on-insulator structure of Claim 97, wherein the oxide glass or oxide glass-ceramic has a 0-300°C coefficient of thermal expansion CTE and a 250°C resistivity ρ which satisfy the relationships:

$$5\text{x}10^{-7}/°\text{C} \leq \text{CTE} \leq 75\text{x}10^{-7}/°\text{C}, \text{ and}$$

$$\rho \leq 10^{16}\ \Omega\text{-cm},$$

said oxide glass or oxide glass-ceramic having a strain point of less than 1,000°C.

101. (Currently Amended) The semiconductor-on-insulator structure of Claim 97, wherein a degree to which the modifier positive ions are absent from the material G with a reduced positive ion concentration, and a degree to which the modifier positive ions exist in the material G with an enhanced positive ion concentration, are such that substantially no ion re-migration from the material G into the material S may occur.

102. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the thickness of material S is less than 10 microns.

103. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the bond strength between material S and material G is at least 8 joules/meter$^2$.

104. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the sum of the concentrations of lithium, sodium, and potassium ions in material G is less than 1.0 weight percent and material S has a maximum dimension greater than 10 centimeters.

105. (Previously Presented) The semiconductor-on-insulator structure of Claim 104 wherein the sum of the concentrations of lithium, sodium, and potassium ions in material G is less than 0.1 weight percent.

106. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein material G is transparent.

107. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 further comprising an amorphous or polycrystalline semiconductor material attached to material G.

108. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the substantially single-crystal semiconductor material is a silicon-based material.

109. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the substantially single-crystal semiconductor material comprises silicon and germanium.

110. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the substantially single-crystal semiconductor material comprises silicon and carbon.

111. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein:

$$CTE_1 - 20x10^{-7}/°C \leq CTE_2 \leq CTE_1 + 20x10^{-7}/°C$$

where $CTE_1$ is the 0°C coefficient of thermal expansion of the substantially single-crystal semiconductor material and $CTE_2$ is the 0-300°C coefficient of thermal expansion of the oxide glass or oxide glass-ceramic.

112. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the oxide glass or oxide glass-ceramic is silica-based.

113. (Withdrawn) A silicon-on-insulator structure comprising first and second layers which are directly attached to one another, said first layer comprising a substantially single-crystal silicon material and said second layer comprising a glass or a glass-ceramic which comprises silica and one or more other oxides as network formers, said first layer comprising a region which contacts the second layer and comprises silicon oxide but does not comprise the one or more other oxides, said region having a thickness which is less than or equal to 200 nanometers.

114. (Withdrawn) The silicon-on-insulator structure of Claim 113 wherein at least one of the one or more other oxides which are network formers is selected from the group consisting of $B_2O_3$, $Al_2O_3$, and $P_2O_5$.

115. (Withdrawn) The silicon-on-insulator structure of Claim 113 wherein the substantially single-crystal silicon material comprises silicon and germanium.

116. (Withdrawn) The silicon-on-insulator structure of Claim 113 wherein the substantially single-crystal silicon material comprises silicon and carbon.

117. (Withdrawn) The silicon-on-insulator structure of Claim 113 wherein the second layer is transparent.

118. (Withdrawn) The silicon-on-insulator structure of Claim 113 wherein the second layer has a thickness $D_2$ which is greater than or equal to 1 micron.

119. (Withdrawn) The silicon-on-insulator structure of Claim 113 wherein the bond strength between the first and second layers is at least 8 joules/meter$^2$.

120. (Withdrawn) The semiconductor-on-insulator structure of Claim 113 wherein the first layer has a surface farthest from the second layer which is an exfoliation surface.

121. (Withdrawn) A semiconductor-on-insulator structure comprising first and second layers which are attached to one another either directly or through one or more intermediate layers, wherein:

(a) the first layer comprises a plurality of regions each of which comprises a substantially single-crystal semiconductor material;

(b) the second layer comprises an oxide glass or an oxide glass-ceramic; and

(c) the regions have surface areas $A_i$ which satisfy the relationship:

$$\sum_{i=1}^{N} A_i > A_T, \ N > 1,$$

where $A_T$ = 750 centimeters$^2$ if any of the regions has a circular perimeter and $A_T$ = 500 centimeters$^2$ if none of the regions has a circular perimeter.

122. (Withdrawn) The semiconductor-on-insulator structure of Claim 121 wherein an edge of at least one of the regions contacts an edge of at least one other of the regions.

123. (Withdrawn) The semiconductor-on-insulator structure of Claim 121 wherein at least one of the regions is spaced from at least one other of the regions.

124. (Withdrawn) The semiconductor-on-insulator structure of Claim 121 wherein at least one of the regions differs from at least one other of the regions in at least one of thickness, surface area, or composition.

125. (Withdrawn) The semiconductor-on-insulator structure of Claim 121 further comprising an amorphous or polycrystalline semiconductor material attached to the second layer.

126. (Withdrawn) The semiconductor-on-insulator structure of Claim 121 wherein the area of the second layer is greater than 750 centimeters$^2$.

127. (Withdrawn) A liquid crystal display comprising the semiconductor-on-insulator structure of Claim 66, 69, 70, 71, 72, 74, 76, 97 or 121.

128. (Withdrawn) A liquid crystal display comprising the silicon-on-insulator structure of Claim 113.

129. (Currently Amended) The semiconductor-on-insulator structure of Claim 97, wherein:

(i) the glass or glass-ceramic comprises one or more of the following modifier positive ions: $Li^{+1}$, $Na^{+1}$, $K^{+1}$, $Cs^{+1}$, $Mg^{+2}$, $Ca^{+2}$, $Sr^{+2}$, and/or $Ba^{+2}$ (the alkali/alkaline-earth ions); and

(ii) the material G with a reduced positive ion concentration ~~the positive ion depletion region~~ is substantially depleted of ~~at least one~~ all of said one or more alkali/alkaline-earth ions.

130. (Currently Amended) The semiconductor-on-insulator structure of Claim 129, wherein:

the material S and material S with an enhanced oxygen content is a first layer;

the material G with a reduced positive ion concentration~~ for at least one type of positive ion~~, the material G with an enhanced positive ion concentration~~ for at least one type of positive ion~~, and the material G is a second layer; and

the material G with a reduced positive ion concentration~~the positive ion depletion region~~ has a thickness $\delta_D$ which satisfies the relationship:

$$\delta_D \geq 10 \text{ nanometers},$$

where $\delta_D$ is a distance between a first face of the second layer and a surface which 1) is within the second layer, 2) is substantially parallel to the first face of the second layer, and 3) is the surface farthest from the first face of the second layer for which the following relationship is satisfied for at least one of the alkali/alkaline-earth ions which the glass or glass-ceramic contains:

$$C_i(x)/C_{i/Ref} \leq 0.5, \quad 0 \leq x \leq \delta_D,$$

where:

$C_i(x)$ is the concentration of said at least one alkali/alkaline-earth ion as a function of distance x from the first face of the second layer, and

$C_i(x)$ and $C_{i/Ref}$ are in atomic percent.

131. (Previously Presented) The semiconductor-on-insulator structure of Claim 130 wherein: $\delta_D \geq 1000$ nanometers.

132. (Previously Presented) The semiconductor-on-insulator structure of Claim 97 wherein the material S and material S with an enhanced oxygen content is a first layer having a thickness $D_S$ which satisfies the relationship: 10 nanometers $\leq D_S \leq$ 500 nanometers.

133. (Currently Amended) The semiconductor-on-insulator structure of Claim 97, wherein:

the material S and material S with an enhanced oxygen content is a first layer;

the material G with a reduced positive ion concentration~~ for at least one type of positive ion~~, the material G with an enhanced positive ion concentration~~ for at least one type of positive ion~~, and the material G is a second layer; and

the first and second layers are directly attached to one another.

134. (Previously Presented) The semiconductor-on-insulator structure of Claim 133 wherein the second layer has a thickness $D_2$ which is greater than or equal to 1 micron.

135. (Currently Amended) A semiconductor-on-insulator layered structure comprising a substantially single-crystal semiconductor material (material S) and an oxide glass or an oxide glass-ceramic which comprises positive ions (material G), wherein at least a part of the structure comprises in order:

material S;

material S with an enhanced oxygen content;

material G with a reduced modifier positive ion concentration~~ for at least one type of positive ion~~;

material G with an enhanced modifier positive ion concentration~~ for at least one type of positive ion~~; and

material G,

wherein the material G with the reduced modifier positive ion concentration is operatble to inhibit ion re-migration from the material G into the material S~~wherein the surface of material S farthest from material G is an exfoliation surface, and the bond strength between material S and material G is at least 8 joules/meter$^2$~~.

136. (Currently Amended) The semiconductor-on-insulator structure of Claim 135, wherein the modifier positive ions include at least one of : $Li^{+1}$, $Na^{+1}$, $K^{+1}$, $Cs^{+1}$, $Mg^{+2}$, $Ca^{+2}$, $Sr^{+2}$, and/or $Ba^{+2}$ ~~A semiconductor-on-insulator layered structure comprising a substantially single-crystal semiconductor material (material S) and an oxide glass or an oxide glass-ceramic which comprises positive ions (material G), wherein at least a part of the structure comprises in order:~~

~~material S;~~

~~material S with an enhanced oxygen content;~~

~~material G with a reduced positive ion concentration for at least one type of positive ion;~~

~~material G with an enhanced positive ion concentration for at least one type of positive ion; and~~

~~material G, wherein~~

~~the surface of material S farthest from material G is an exfoliation surface, and~~

~~$CTE_1 - 20x10^{-7}/°C \leq CTE_2 \leq CTE_1 + 20x10^{-7}/°C$,~~

~~where $CTE_1$ is the 0°C coefficient of thermal expansion of the substantially single-crystal semiconductor material and $CTE_2$ is the 0-300°C coefficient of thermal expansion of the oxide glass or oxide glass-ceramic.~~

137. (New) The semiconductor-on-insulator structure of Claim 136, wherein the material G with a reduced modifier positive ion concentration is substantially depleted of all of said alkali/alkaline-earth ions.

138. (New) The semiconductor-on-insulator structure of Claim 135, wherein the material G with a reduced modifier positive ion concentration includes one or more network forming ions.

139. (New) A semiconductor-on-insulator layered structure, comprising:

a first layer of substantially single-crystal semiconductor material;

a second layer of substantially single-crystal semiconductor material with an enhanced oxygen content located on the first layer; and

a substrate of an oxide glass or an oxide glass-ceramic having: (i) a first substrate layer adjacent the second layer of substantially single-crystal semiconductor material, the first substrate layer having a reduced positive ion concentration in which substantially no modifier positive ions are present, and (ii) a second substrate layer adjacent the first substrate layer and having an enhanced positive ion concentration of modifier positive ions, including at least one alkaline earth modifier ion.

140. (New) The semiconductor-on-insulator structure of Claim 139, wherein the substrate of an oxide glass or an oxide glass-ceramic further includes a third substrate layer adjacent the second substrate layer.

141. (New) The semiconductor-on-insulator structure of Claim 139, wherein the first substrate layer with a reduced modifier positive ion concentration is substantially depleted of all alkali/alkaline-earth ions.

142. (New) The semiconductor-on-insulator structure of Claim 141, wherein the first substrate layer with a reduced modifier positive ion concentration includes one or more network forming ions.

143. (New) The semiconductor-on-insulator structure of Claim 139, wherein the modifier positive ions include at least one of : $Li^{+1}$, $Na^{+1}$, $K^{+1}$, $Cs^{+1}$, $Mg^{+2}$, $Ca^{+2}$, $Sr^{+2}$, and/or $Ba^{+2}$.

144. (New) The semiconductor-on-insulator structure of Claim 139, wherein the enhanced positive ion concentration of modifier positive ions of the second substrate layer moved from the first substrate layer.